APRIL/MAY 2024

23PCA21 — DATA STRUCTURES AND ALGORITHMS

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What is data abstraction?
2. What is a Map?
3. How to draw the markings of a typical English ruler?
4. What is called amortization?
5. Define queue.
6. What is binary search tree?
7. What is Heap-Order property?
8. Write the insertionsort algorithm.
9. Define AVL tree.
10. What is the main idea of Quick-Sort procedure?

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions.

11. (a) What is a bag? Explain its implementation.

Or

(b) Demonstrate the implementation of the Array 2D abstract data type using an array of arrays.

12. (a) Explain the three-way set disjointness problem with a code segment.

Or

(b) Demonstrate the binary search method with a python code.

13. (a) Explain the stack implementation using python list.

Or

(b) Explain the procedure for computing depth and height of a Tree.

14. (a) Describe the priority queue ADT methods.

Or

(b) Discuss the collision-handling schemes used in hash tables.

15. (a) Discuss the various sorting algorithms using Linear-Time performance.

Or

(b) Develop the Prim-Jarnik algorithm for the MST problem.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the implementation modules for set ADT.

17. Briefly discuss the seven most important functions used in the analysis of algorithms.

18. Explain the algorithms for queue implementation using linked list.

19. Explain the data structure skip list in detail.

20. Explain the operations on binary search tree.

———————